



Acceptance of Burger Bun with the Addition of Kluwek as A Natural Color

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ABSTRACTS

In 2012 burger buns with various colors appeared in Japan. However, it is feared that the use of food coloring, especially synthetic food coloring, could have bad effects on the body and the environment. Natural food coloring can be found in animals, plants and microbes. Kluwek seeds contain tannin and flavonoid compounds as an alternative to synthetic coloring substances such as Chocolate Brown FH and Chocolate Brown HT food. The purpose of this research is to find the right formula for the Kluwek Bun Biji Burger and the acceptability of the product to consumers. The experiment used in this research used the Quantitative Descriptive Analysis (QDA) method with an expert panelist approach and then a hedonic test was carried out to determine the acceptability of the product. Product trials were carried out four times with the final product selected being a product with the code BBK4 with a ratio of kluwek pasta to wheat flour of 1:2. The results of the hedonic test stated that 60% of panelists liked it in terms of color, 46% of panelists liked it in terms of aroma, 53% of panelists liked it in terms of taste, 59% of panelists liked it in terms of texture and 57% of panelists liked it in terms of overall appearance. This shows that the product is well received by respondents.

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1. INTRODUCTION

Bread is a leavened food that is widely consumed by the public. Bread is generally divided into three types, namely Lean yeast dough which is a bread dough that only consists of 4 main ingredients, namely wheat flour, yeast, salt and water. This type of bread contains 0-1%. Some lean yeast dough products include French bread, Italian bread and hard rolls. Soft medium dough contains 6-9% fat and sugar so the dough tends to be more elastic. One of the products from this type of bread dough is Pullman bread or more commonly known as the bread used for sandwiches. Rich yeast dough has the same 4 main ingredients as lean rich dough but adds other ingredients such as milk, eggs and fat so that the texture is softer and more flavourful. Some rich yeast dough products include sweet roll bread and toast bread (Gusnadi & Achmad, 2018). One of the derivative products from sweet roll bread which is the result of rich yeast dough is burger bun.

Burger bun is a bun made from high protein wheat flour, yeast, sugar, bread improver, salt, butter, powdered milk, water and usually with the addition of sesame seeds. Burger buns were first used as sandwiches or better known as hamburgers (Winarno, 2016). When compared to regular bread, burger buns contain more sugar and fat. Linshi (2014) said in his article on a TIME magazine page that in 2012 one of the fast food franchise brands in Japan launched a burger with black bread under the name "Kuro Pearl Burger". The black color produced comes from bamboo charcoal and squid ink. Another black burger bun also appeared with the addition of breadfruit (Putri, 2018) as well as a purple burger bun with the addition of purple sweet potato flour (Amaly, 2019). However, the use of squid ink can trigger allergies similar to seafood allergies (Brennan, 2012).

Nugraheni (2014) states that coloring is an additional ingredient added to food with the aim of giving it a distinctive color and making the characteristic of a food unique. The addition of coloring to this food makes the product attractive and increases consumer appeal. Natural dyes are dyes (pigments) that can come from plants, animals or mineral substances. Natural dyes (pigments) originating from plants and animals can include carotenoids, chlorophyll, tannins, flavonoids and quinones.

Kluwek (*pangium edule* reinw.) is usually used as a coloring which aims to add color density to dishes, but also provides a distinctive taste. It is a plant that produces fruit which can be used as spices, preservatives, dyes and medicines (Sari R & Suhartati, 2015). The application of kluwek in Indonesian dishes includes the typical Rawon with its blackish sauce, Pallu Kaloa, Betawi Pucung vegetables and so on. Kluwek, which is used as a cooking spice to produce a blackish brown color, must be chosen when kluwek is ripe or old, which is indicated by the sound of the seed flesh when shaken (Warasari, 2018). The brown dye found in kluwek can be used as an alternative to synthetic dyes such as Chocolate Brown FH and Chocolate Brown HT. Warnasih (2018) stated that kluwek with water as a solvent produces a dark brown extract color and contains positive results for containing tannin and flavonoid compounds. And it is suspected that kluwek extract contains thick tannin compounds (proanthocyanidins tannin) or condensed tannins, namely flavonoid tannins.

2. METHODOLOGY

2.1. Research Methods

The type of research carried out is experimental research. Where this method is a research method used to find the effect of several treatments on other treatments under controlled conditions. The experiment was carried out to determine the amount of kluwek that will be

used in making burger buns based on the level of preference which includes the categories of taste, aroma, texture and appearance.

The QDA test was carried out with expert panelists who were executive chefs, sous chefs and pastry chefs at the Holiday Inn Bandung Pasteur. Measurements use a structured line scale that has a length of 10 cm with a scale value of 0 being the lowest. Sensory components that will be assessed in the QDA test include color, aroma, taste, texture and overall appearance. Products that pass the QDA test will continue with a hedonic test with 30 consumer panelists who are the general public with an age range of 18-60 years in Sukagalih, Bandung who are taken randomly. The research time, including the QDA test and acceptability test, was carried out in June - August 2023. The place for product testing during the research was carried out in the Pastry Lab of the Culinary Education study program at the Indonesian Education University.

2.2. Materials and Tools

High protein wheat flour, yeast, sugar, bread improver, salt, butter, milk powder, water and usually the addition of sesame seeds are the ingredients used in this research. The tools used include preparation tools (digital scales, measuring spoons, measuring cups), processing tools (stove, pan, mixer, baking sheet, oven) and also serving tools (duplex box measuring 15×5×5 cm).

Tabel 1. Bun Kluwek Burger Formula

Material Name	BBK1	BBK2	BBK3	BBK4
High protein wheat flour	150g	150g	150g	150g
Sugar	12g	12g	12g	12g
Instant yeast	3g	3g	3g	3g
Egg	8g	8g	8g	8g
Kluwek soaking water	82g			
Kluwek pasta		35g	50g	75g
Water		65g	38g	24g
Milk powder	9g	9g	9g	9g
Bread improver	¼ tsp	¼ tsp	¼ tsp	¼ tsp
Salt	3g	3g	3g	3g
Butter	7g	7g	7g	7g

2.3. The Process of Making Burger Buns

The composition of the ingredients for developing the bun kluwek burger formula can be seen in table 1.

Meanwhile, the flow of making bun kluwek burgers can be seen in Figure 1.

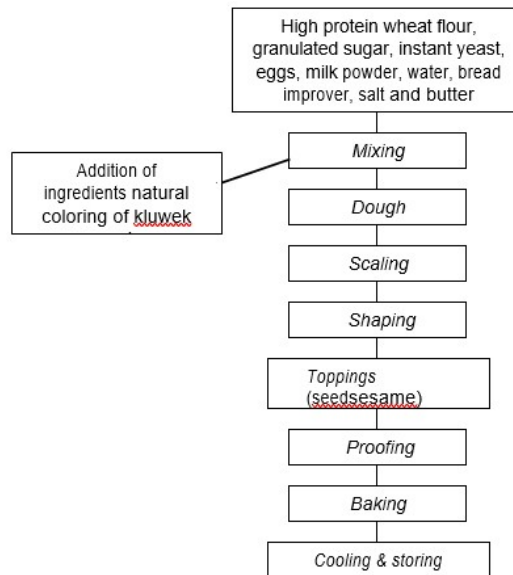


Figure 1. The flow of making bun kluwek burgers

2.4. Analysis Data

Descriptive analysis was used to analyze the data used in this research. One descriptive test method is the Quantitative Descriptive Analysis (QDA) method with a line scale with a length of 10 cm to determine the product with the best possible acceptability and a consumer acceptability test using a Likert scale to determine product acceptability. Measuring values on the QDA test line scale uses a measuring instrument in the form of a ruler. After taking measurements, the data will be entered into Microsoft Excel 2016 and then processed into a spider web graph. The spider web graph functions to show the profile of the sensory test results.

Data analysis for acceptability by means of consumer panelists giving ratings of whether they like or dislike the product on a score scale. In data analysis, five sample parameters were used, consisting of color, texture, aroma, taste and overall appearance. The score range in the assessment is 4–1 with the information 4 = really like it, 3 = like it, 2 = normal and 1 = don't like it.

3. RESEARCH RESULT

3.1. QDA Test Results

The QDA (Quantitative Descriptive Analysis) test was carried out 3 times with 3 expert panelists who were executive chefs, sous chefs and pastry chefs at the Holiday Inn Bandung Pasteur. Samples from the 1st trial, 2nd trial and 3rd trial were consulted with the supervisor, then improvements were made, then the next trial, including the mini burger product, was tested by expert panelists. The samples tested by the expert panelists were the reference product BB1 and the 3rd and 4th trial samples, namely BBK3 and BBK4. Mini burger products using bun kluwek burgers were also tested on expert panelists with the product code BBKW. The values of the four products tested will be seen in table 2 and the spider web chart.

Table 2. Average QDA Test Results for Burger Bun Kluwek

Component	BB1	BBK3	BBK4	BBKW
Color	4.3	7.3	8.8	8.5
Texture	6	7.9	8.3	7.9
Aroma	4.9	6	8.3	7.1

Flavor	4.9	7	6,7	7.1
Overall appearance	7.7	7.9	8.9	8.2

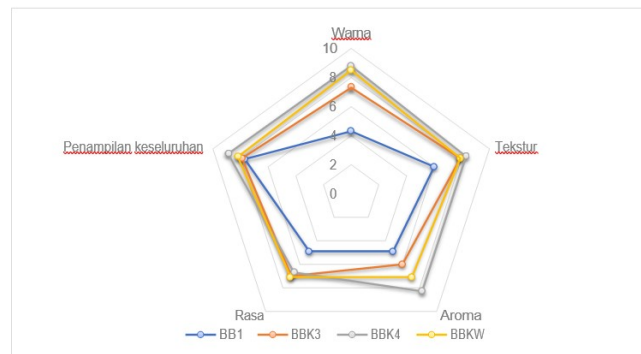


Figure 2. Average QDA Test Results for Burger Bun Kluwek

3.2. Hedonic Test Results

The hedonic test of the Burger Bun Kluwek product was carried out on 14-15 August 2023, in the neighborhood of Sukagalih, Bandung. The Likert scale for assessment used is really like = 4, like = 3, usually = 2, don't like = 1. The following are the results of the hedonic test that was carried out.

3.2.1. Color

The results of the hedonic test for color components for the Kluwek Bun Biji Burger and the Mini Burger with Kluwek Bun Biji Burger can be seen in the circle diagram presented in figure 3 and figure 4 obtained from 30 consumer panelists.



Figure 3. Burger Bun Hedonic Test Results Color Components



Figure 4. Mini Burger Hedonic Test Results Color Components

The diagram in Figure 3 shows that 27% of the panelists (7 people) stated that they really liked the color of the Kluwek bun seed burger product. Then 60% of the panelists (17 people) said they liked it, 13% of the panelists (4 people) said they were normal and 0% of the panelists said they didn't like the color of the Burger Bun Biji Kluwek product. Meanwhile, the diagram in Figure 4 shows that 26% of the panelists (7 people) stated that they really liked the color of the mini burger product with the kluwek seed bun burger. Then 64% of the panelists (20 people) said they liked it, 10% of the panelists (3 people) said they were normal and 0% of the panelists said they didn't like the color of the Mini Burger product with the Kluwek Biji Bun Burger.

Based on the percentages obtained from the two products tested, it can be concluded that overall, consumer panelists predominantly stated that they "liked" the color of the Burger Bun Biji Kluwek Natural Coloring product. So, the color of Burger Bun Natural Kluwek Seed Coloring was received positively by the panelists.

3.2.2. Aroma

The results of the hedonic test for aroma components for the Kluwek Bun Biji Burger and the Mini Burger with Kluwek Bun Biji Burger can be seen in the circle diagram presented in figure 5 and figure 6 obtained from 30 consumer panelists.

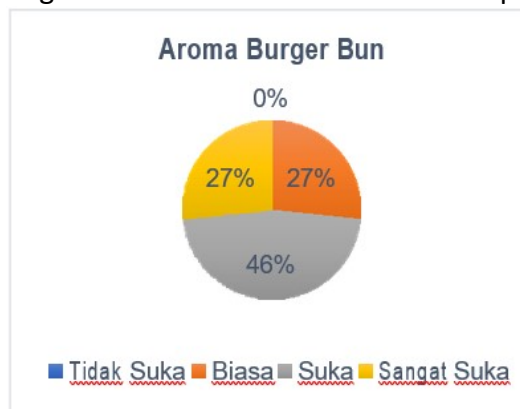


Figure 5. Burger Bun Hedonic Test Results Fragrance Components

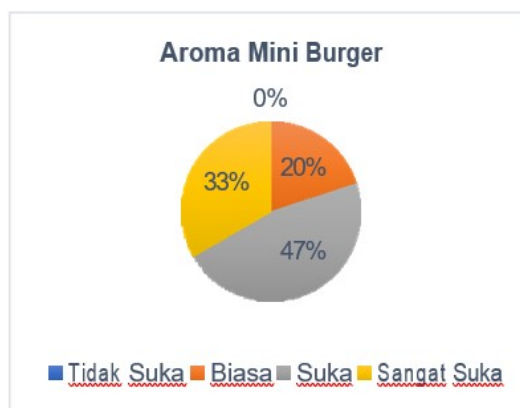


Figure 6. Mini Burger Hedonic Test Results Fragrance Components

The diagram in Figure 5 shows that 24% of the panelists (8 people) stated that they really liked the aroma of the Kluwek bun seed burger product. Then 52% of the panelists (14 people) said they liked it, 23% of the panelists (8 people) said they were used to it and 0% of the panelists said they didn't like the aroma of the Burger Bun Biji Kluwek product.

Meanwhile, the diagram in Figure 6 shows that 33% of the panelists (10 people) stated that they really liked the aroma of the mini burger product with the kluwek seed bun burger. Then 47% of the panelists (11 people) said they liked it, 20% of the panelists (6 people) said they were normal and 0% of the panelists said they didn't like the aroma of the Mini Burger product with Kluwek Biji Bun Burger.

Based on the percentages obtained from the two products tested, it can be concluded that overall, the consumer panelists predominantly stated that they "liked" the aroma of the Kluwek Biji Natural Coloring Burger Bun product. So the aroma of Burger Bun Natural Kluwek Seed Coloring can be received positively by the panellists.

3.2.3. Flavor

The results of the hedonic test for taste components for the Kluwek Bun Biji Burger and the Mini Burger with Kluwek Bun Biji Burger can be seen in the circle diagram presented in figure 7 and figure 8 obtained from 30 consumer panelists.

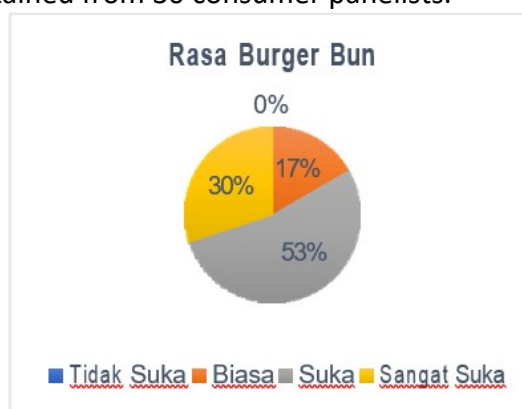


Figure 7. Burger Bun Hedonic Test Results Taste Components

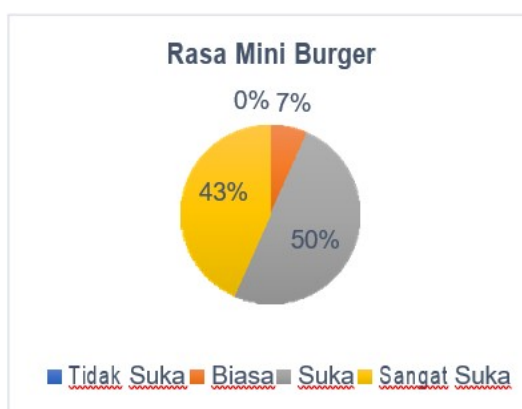


Figure 8. Mini Burger Hedonic Test Results Taste Components

The diagram in Figure 7 shows that 30% of the panelists (10 people) stated that they really liked the color of the Kluwek bun seed burger product. Then 53% of the panelists (16 people) said they liked it, 17% of the panelists (5 people) said they were normal and 0% of the panelists said they didn't like the color of the Burger Bun Biji Kluwek product. Meanwhile, the diagram in Figure 8 shows that 43% of the panelists (13 people) stated that they really liked the taste of the kluwek bun seed burger product. Then 50% of the panelists (15 people) said they liked it, 7% of the panelists (2 people) said they were normal and 0% of the panelists said they didn't like the color of the Mini Burger Bun product with the Kluwek Seed Burger Bun.

Based on the percentages obtained from the two products tested, it can be concluded that overall, the consumer panelists predominantly stated that they "liked" the taste of the Kluwek Biji Natural Coloring Burger Bun product. So, the taste of Burger Bun with Natural Kluwek Seed Coloring was received positively by the panelists.

3.2.4. Texture

The results of the hedonic test for the texture component for the Kluwek Bun Biji Burger and the Mini Burger with Kluwek Biji Bun Burger can be seen in the circle diagram presented in figure 9 and figure 10 obtained from 30 consumer panelists.

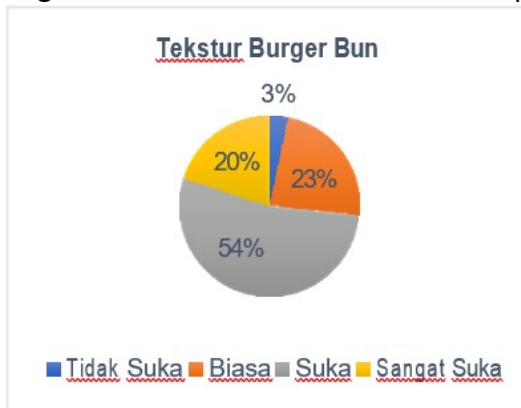


Figure 9. Burger Bun Hedonic Test Results Texture Components

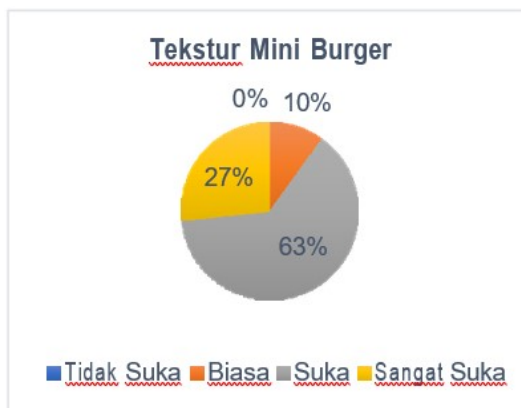


Figure 10. Mini Hedonic Test Results Burger Component

The diagram in Figure 9 shows that 23% of the panelists (6 people) stated that they really liked the texture of the Kluwek bun seed burger product. Then 54% of the panelists (16 people) said they liked it, 20% of the panelists (7 people) said they were normal and 3% of the panelists (1 person) said they didn't like the color of the Burger Bun Biji Kluwek product. Meanwhile, the diagram in Figure 10 shows that 27% of the panelists (8 people) stated that they really liked the texture of the Kluwek bun seed burger product. Then 63% of panelists (19 people) said they liked it, 10% of panelists (3 people) said they were normal and 0% of panelists said they didn't like the texture of the Mini Burger Bun product with Kluwek Seed Burger Bun.

Based on the percentages obtained from the two products tested, it can be concluded that overall, the consumer panelists predominantly stated that they "liked" the texture of the Kluwek Biji Natural Coloring Burger Bun product. So, the taste of Burger Bun with Natural Kluwek Seed Coloring was received positively by the panelists.

3.2.5. Overall Appearance

The results of the hedonic test for the overall appearance components for the Kluwek Bun Biji Burger and the Mini Burger with Kluwek Bun Biji Burger can be seen in the circle diagram presented in figure 11 and figure 12 obtained from 30 consumer panelists.



Figure 11. Burger Bun Hedonic Test Results Overall Appearance Components

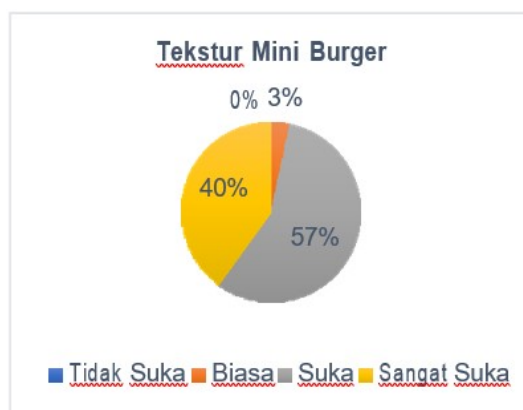


Figure 12. Mini Burger Hedonic Test Results for Overall Appearance Components

The diagram in Figure 11 shows that 33% of the panelists (10 people) stated that they really liked the overall appearance of the Kluwek Bun Seed Burger product. Then 57% of the panelists (17 people) said they liked it, 10% of the panelists (3 people) said they were normal and 0% of the panelists said they didn't like the overall appearance of the Burger Bun Biji Kluwek product. Meanwhile, the diagram in Figure 12 shows that 40% of the panelists (12 people) stated that they really liked the overall appearance of the Kluwek Bun Seed Burger product. Then 57% of the panelists (17 people) said they liked it, 3% of the panelists (1 person) said they were normal and 0% of the panelists said they didn't like the overall appearance of the Mini Burger Bun product with the Kluwek Seed Burger Bun.

Based on the percentages obtained from the two products tested, it can be concluded that overall, consumer panelists predominantly stated that they "liked" the overall appearance of the Burger Bun Biji Kluwek Natural Coloring product. So, the taste of Burger Bun with Natural Kluwek Seed Coloring was received positively by the panelists.

4. CONCLUSION

The results of the research were the kluwek seed bun burger formula which obtained the expected color obtained from a 1:2 ratio between kluwek seed paste and teigu flour. Because quite a lot of pasta is used, this affects the use of water in the formula, so the amount of water is reduced. The QDA test with the BBK4 product received a good

assessment from expert panelists. The results of a series of product trials resulted in the BBK4 product formula being used as the standard recipe for Burger Bun Kluwek. Samples of the BBK4 and BBKW products, which are mini burgers with kluwek seed bun burgers, were then hedonic tested on consumer panelists to see the product's acceptability. Based on hedonic test data, the kluwek bun seed burger (BBK4) from the color component is in the like category, the aroma is in the like category, the taste is in the like category, the texture is in the like category and the overall appearance is also in the like category. For the BBKW hedonic data test, the color component is in the like category, the aroma is in the like category, the taste is in the really like category, the texture is in the like category and the overall appearance is in the really like category. Overall, the 5 sensory components which include color, aroma, taste, texture and overall appearance of the Bun Biji Kluwek Burger have the acceptability of "liked" and can be accepted positively by respondents.

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